Long-term follow-up of cardiac resynchronization therapy patients with non-ischemic dilated cardiomyopathy assessed by radionuclide angiography

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Background: While the beneficial effects of cardiac resynchronization therapy (CRT) have been widely investigated soon after CRT implantation, relatively few data are available on long-term clinical outcomes of CRT recipients.

Aim: To investigate long-term outcomes of CRT patients with non-ischemic dilated cardiomyopathy stratified as responders and non-responders according to radionuclide angiography.

Methods: Consecutive heart failure patients with non-ischemic dilated cardiomyopathy undergoing CRT implantation at our University Hospital between 2007 and 2013 were enrolled. All patients were assessed with equilibrium Tc99 radionuclide angiography at baseline and after 3 months of CRT. Left ventricular (LV) ejection fraction was computed on the basis of relative end-diastolic and end-systolic counts, and intraventricular dyssynchrony was derived by Fourier phase analysis. Response to CRT was defined by an absolute increase in LV ejection fraction (LVEF) $\geq$5% at 3-month follow-up. Clinical outcome was assessed after 10 years through hospital records review.

Results: Forty-seven patients (83% men, 63±11 years) were included in the study. At 3 months, 25 (53%) patients were identified as CRT responders according to LVEF increase (from 26±8 to 38±12%, $p<0.001$). In these patients, LV dyssynchrony decreased from 59±30° to 29±18° ($p<0.001$). Twenty-two (47%) patients were defined as non-responders. No significant changes in LVEF and LV dyssynchrony (50±30° vs. 38±19°, p=0.07) were observed in non-responders. At long-term follow-up (11±2 years), all-cause and cardiac mortality rates were 24% and 12% in responders vs. 32% and 27% in non-responders, respectively (p=ns). Heart transplantation was performed in 3 patients. One (4%) patient among CRT responders compared with 6 (27%) patients among non-responders died of worsening heart failure (p=0.03).

Conclusions: Although late overall mortality of non-ischemic CRT recipients was not significantly different between mid-term responders and non-responders, CRT responders were at lower risk of worsening heart failure death.